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Other: ONLINE:INTERNET, EPOQUE

(54) Abstract Title

Methods for information interaction using both mobile and fixed communications and single and multi-screen displays for enhanced functionality, transaction integrity, security and usability.

(57) Advances in mobile telephones have bought a revolution in interpersonal contact and communications. Ease of use, convenience and low cost have been factors in growth. Applications are set to grow with enhanced speed and features. Security has been realised with SIM cards and passwords. With the explosion of other digital services, including Internet, Intranets, Digital TV's and home networking there are challenges for co-ordinating information. The mobile phone already provides communication and security. By adding mobile communications signatures, in an interactive manner, to other networks combined functionality is enhanced. The mobile phone provides a single point for security, authentication, personalisation, administration and billing for digital transactions. By establishing connectivity between mobile phones and other intelligent devices and using knowledge of the mobile user, enhanced security and administration is achieved. Novel methods are described for achieving the interactivity, transparency and enhanced connectivity for user-computer-content interactions across single and multiple networks.

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Figure 1

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Interactive Coherence Across Multiple Networks
Preserving User Integrity Across Multiple Devices

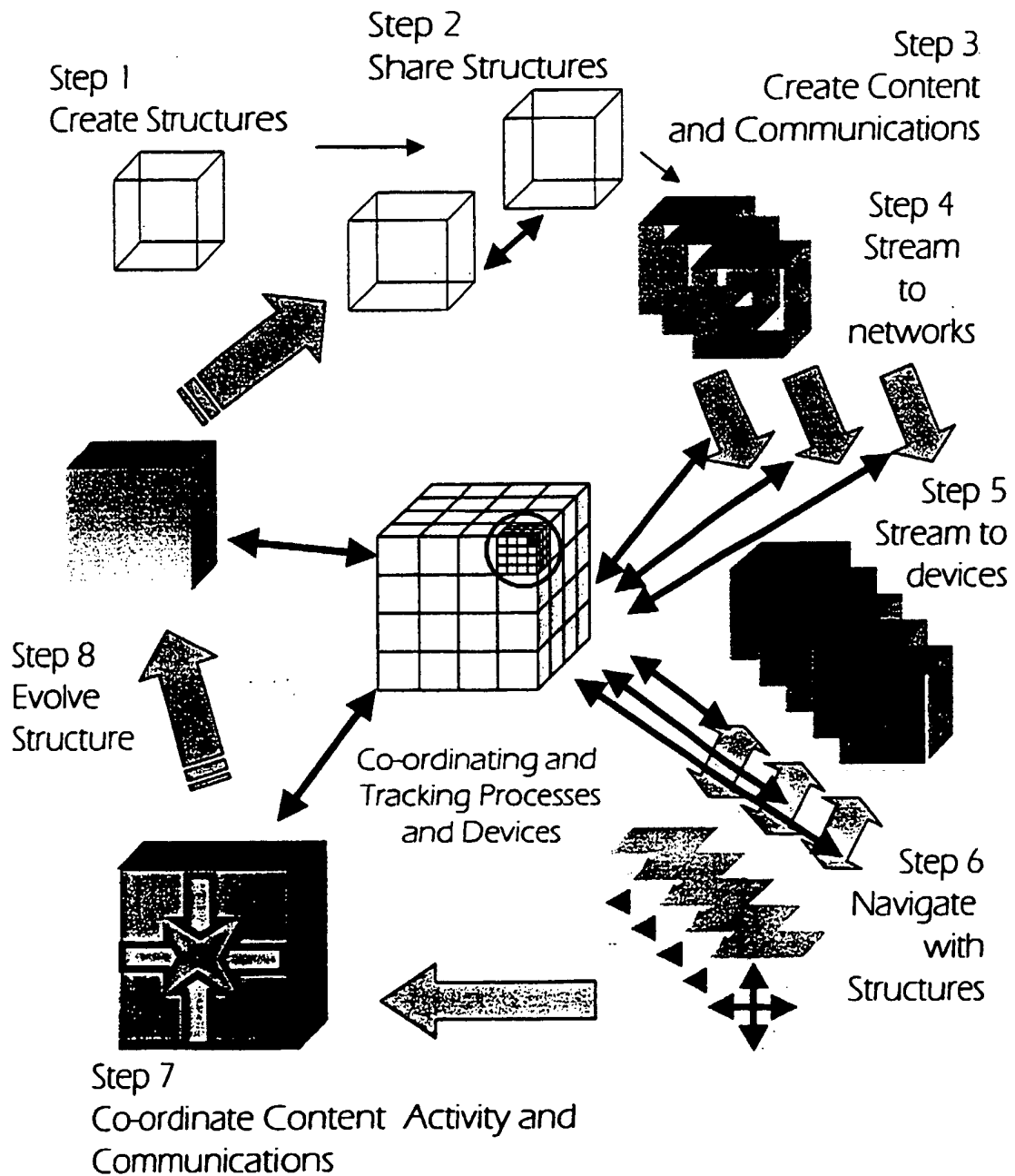


Figure 2
Iterative Application of the Method
Throughout an Information Cycle

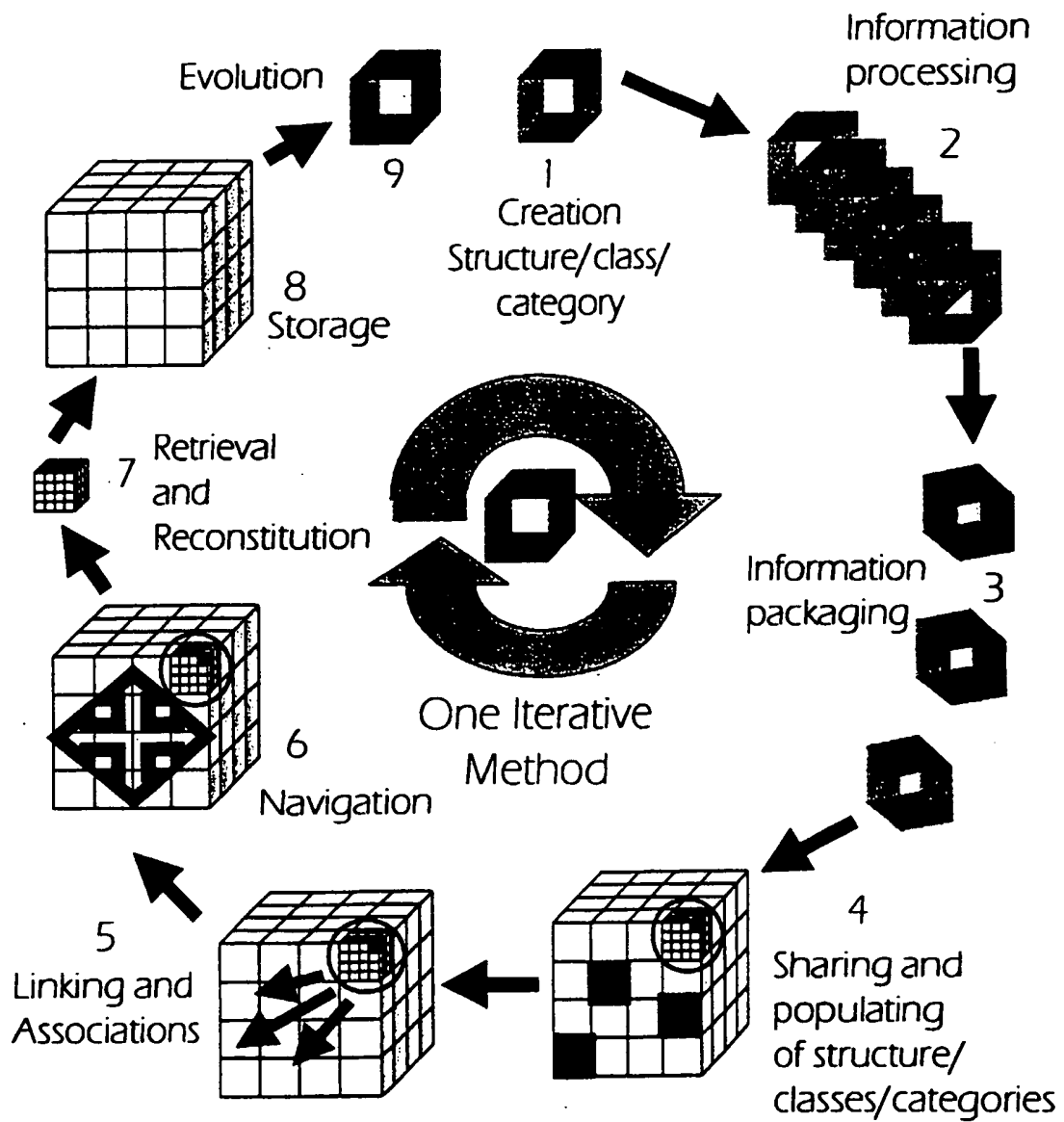


Figure 3

Possible Hardware Realisations - Telephones

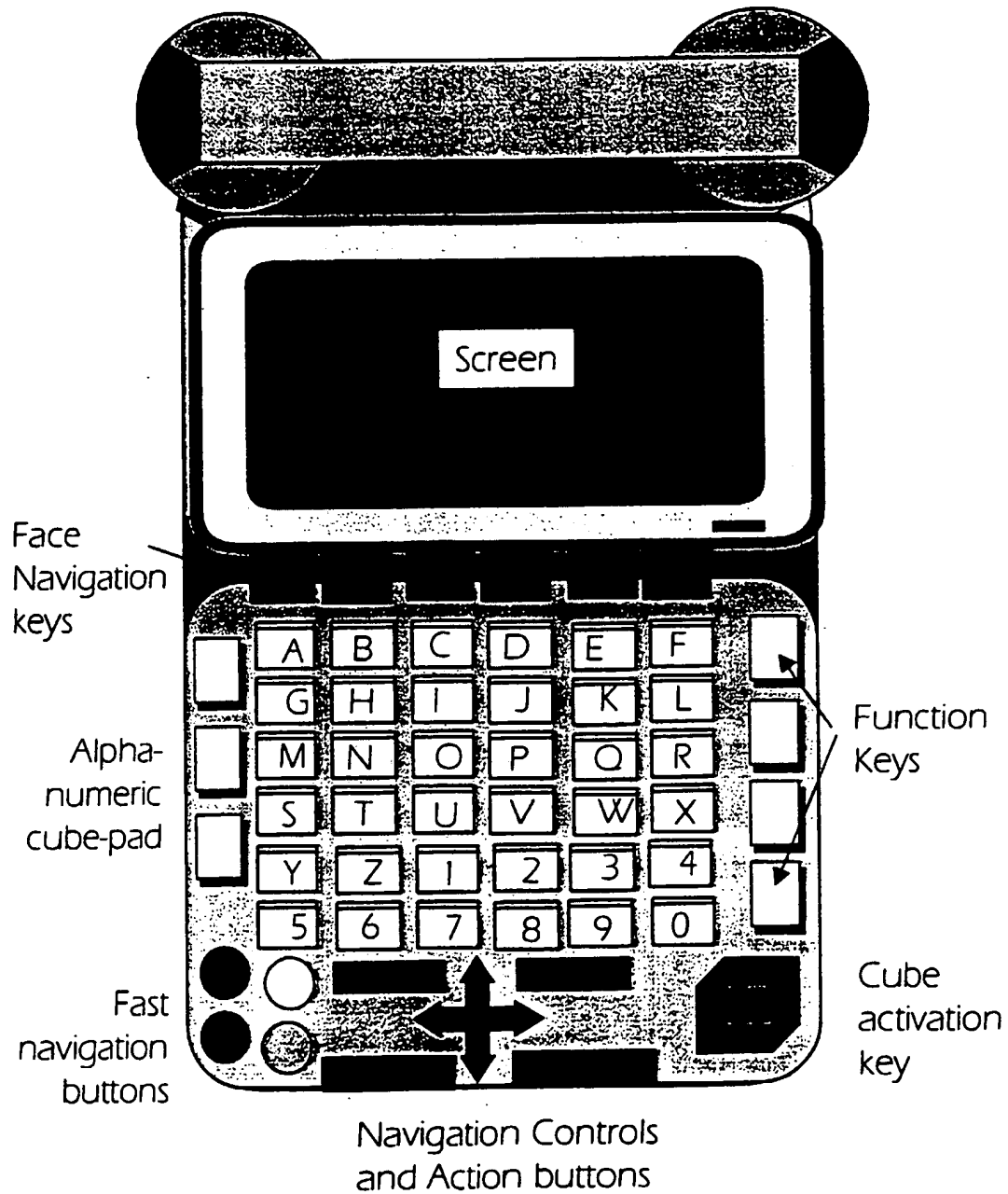


Figure 4
Other example Hardware Realisations -
Computers, Screens, Digital Assistants
Information Kiosks, etc.

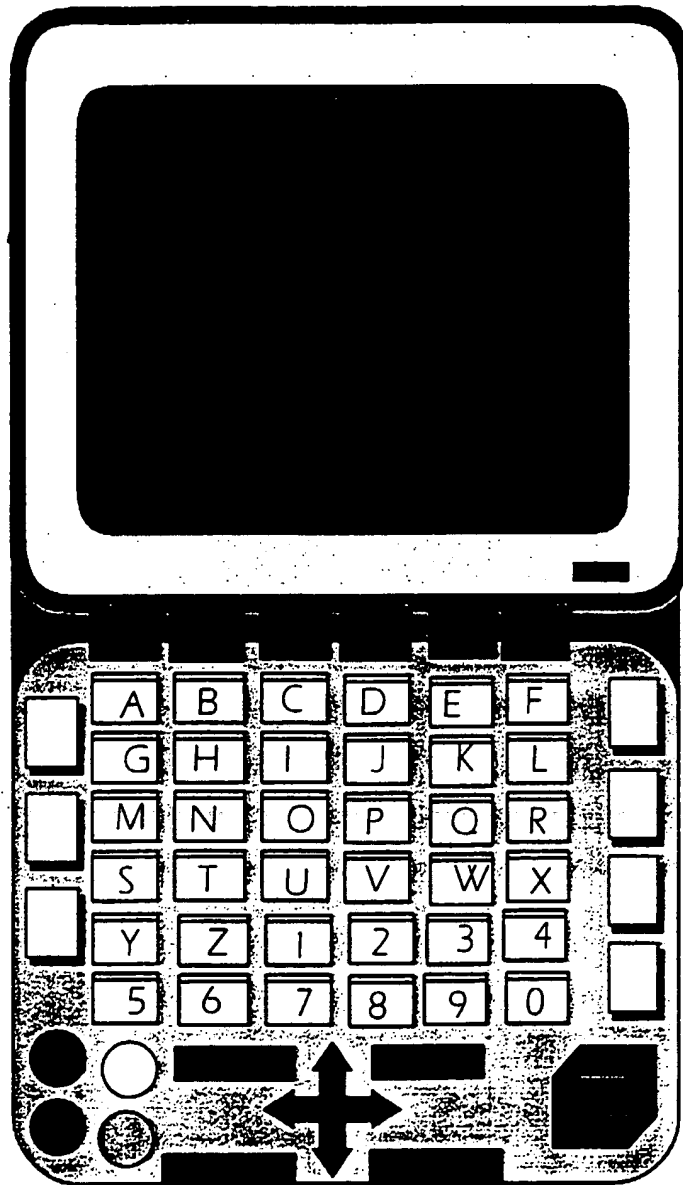


Figure 5
Embodiment of the Method and Process in
Hardware Interfaces - Some Examples

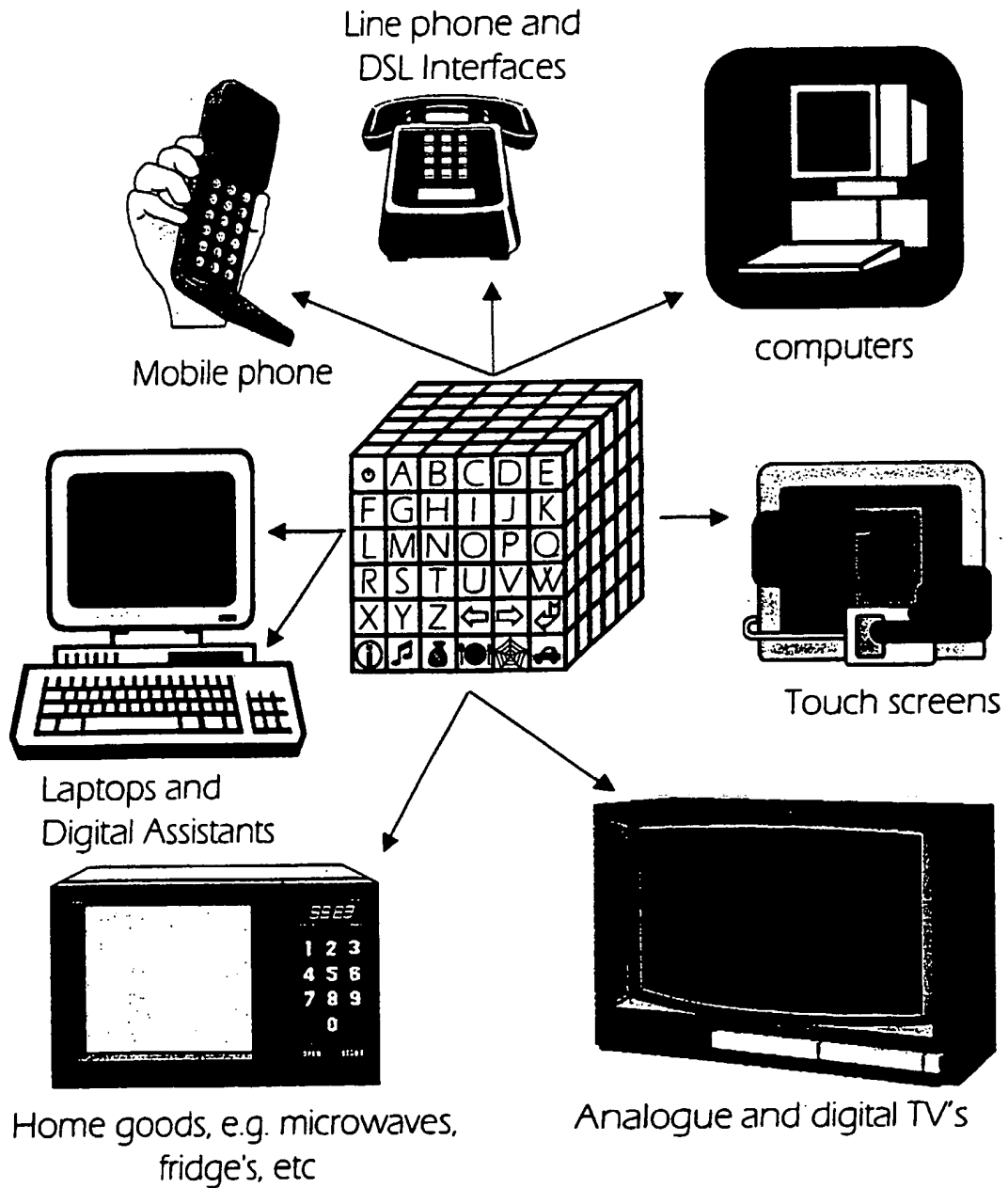


Figure 6 Integrating discrete technology infrastructures for end-to-end enhanced services and user security

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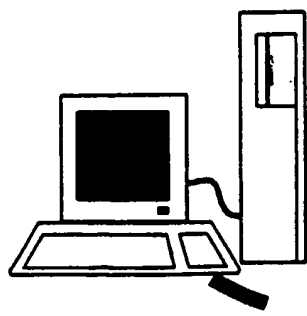


Fig 6a Personal Computer and Network Internet "Wave"



Fig 6b Mobile telephony "wave"



Fig 6c Combined end to end "wave"



User A



User B



User ...n

Fig 6d Unique user "wave profiles" to give digital watermarking

Fig 7 Ubiquitous Secure Transactions across multiple devices, locations and networks 7/12

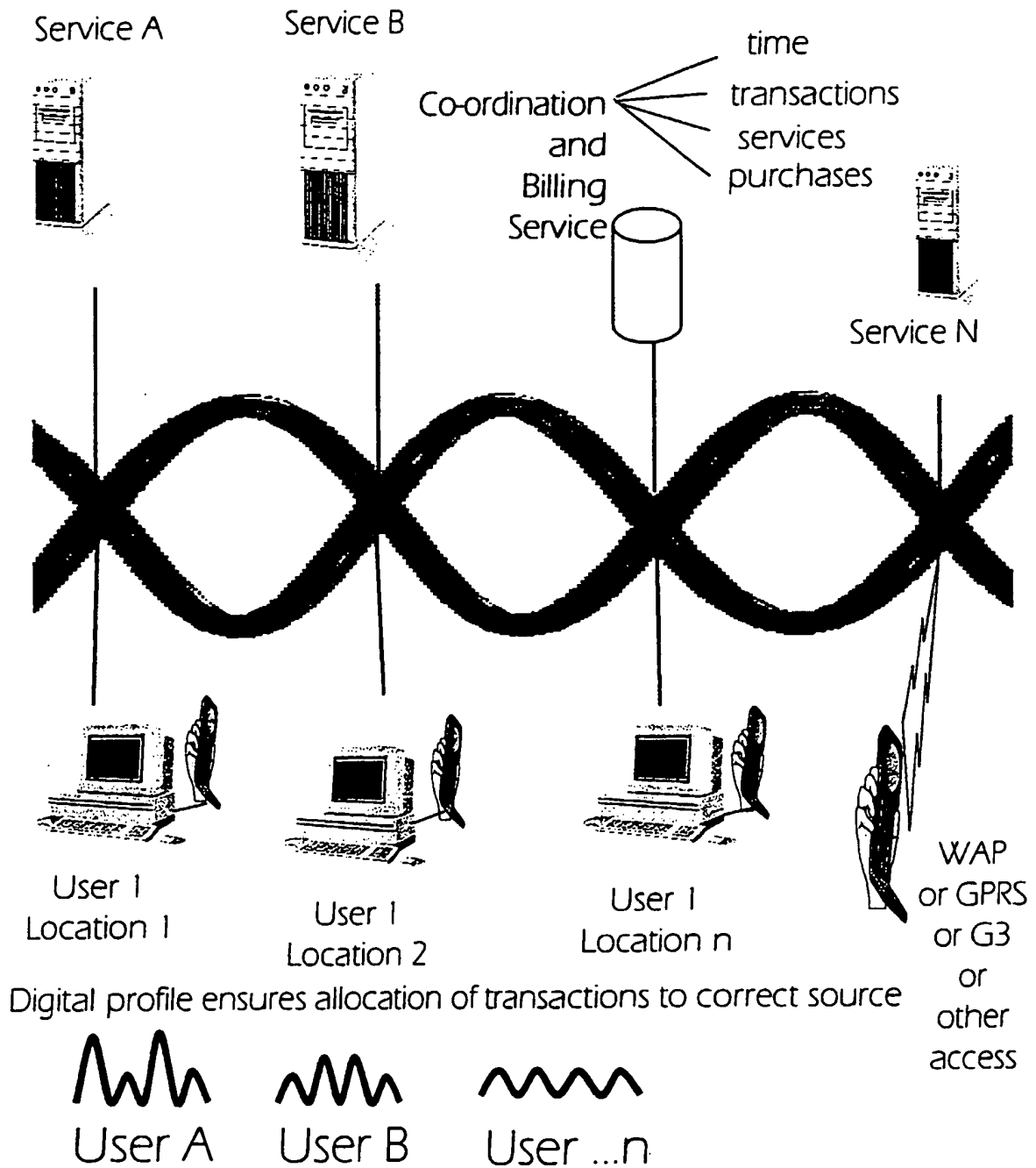


Fig 8
Example applications from multi-network
integration

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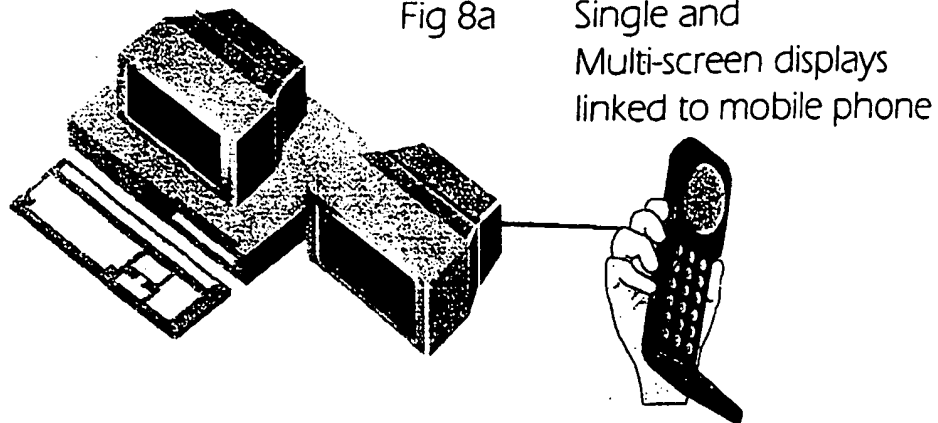


Fig 8b Digital TV linked to mobile phone

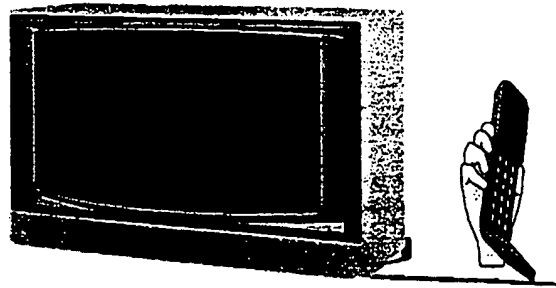


Fig 8c Information kiosks with connection personalisation and Global Positioning Systems with Internet Access

Fig 9 Sales, Security and other Cycles
with fixed and mobile integration

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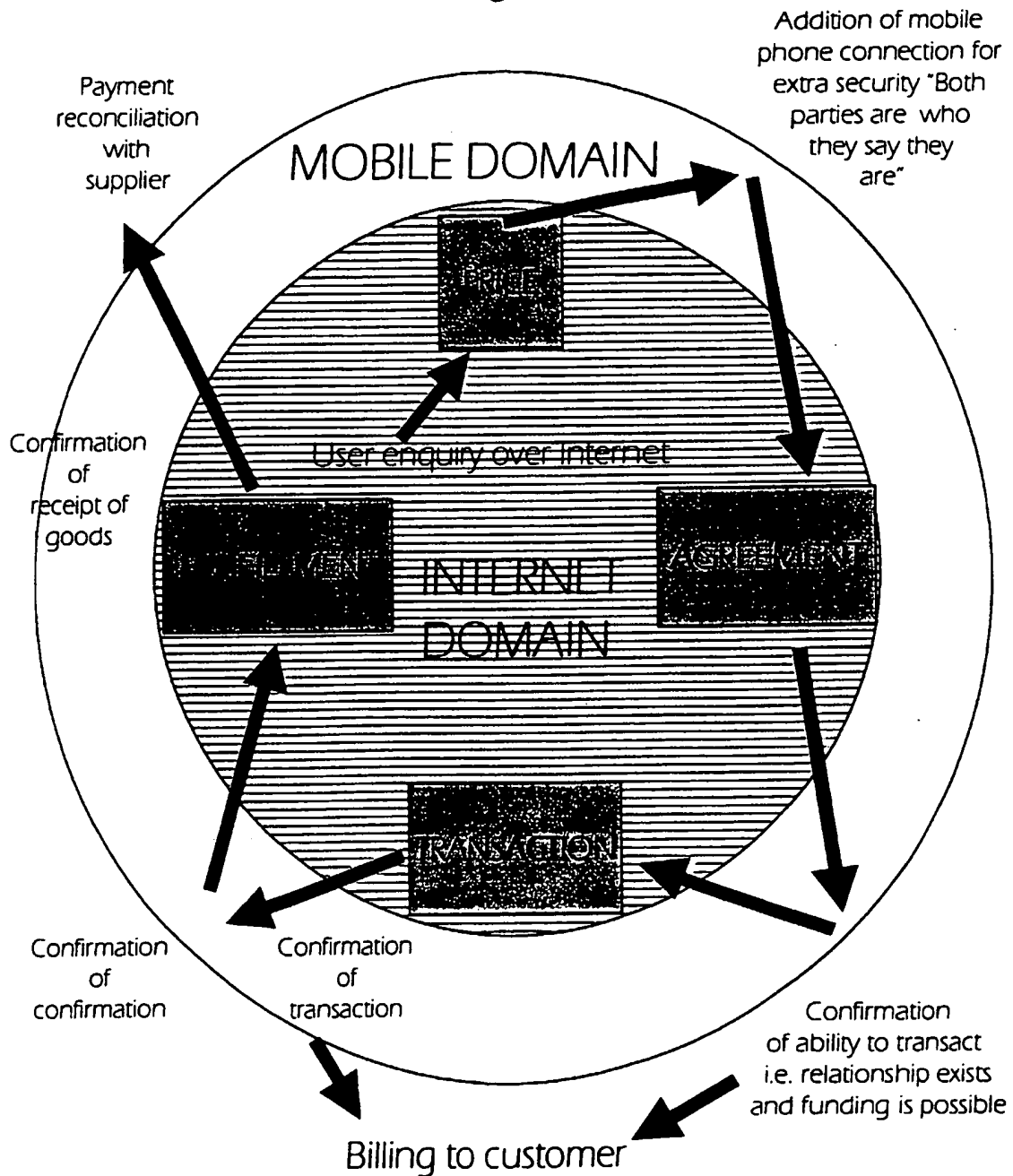


Figure 10
Methods for Structured Multi-group Multi-Network Information
Delivery, Co-ordination and Tracking

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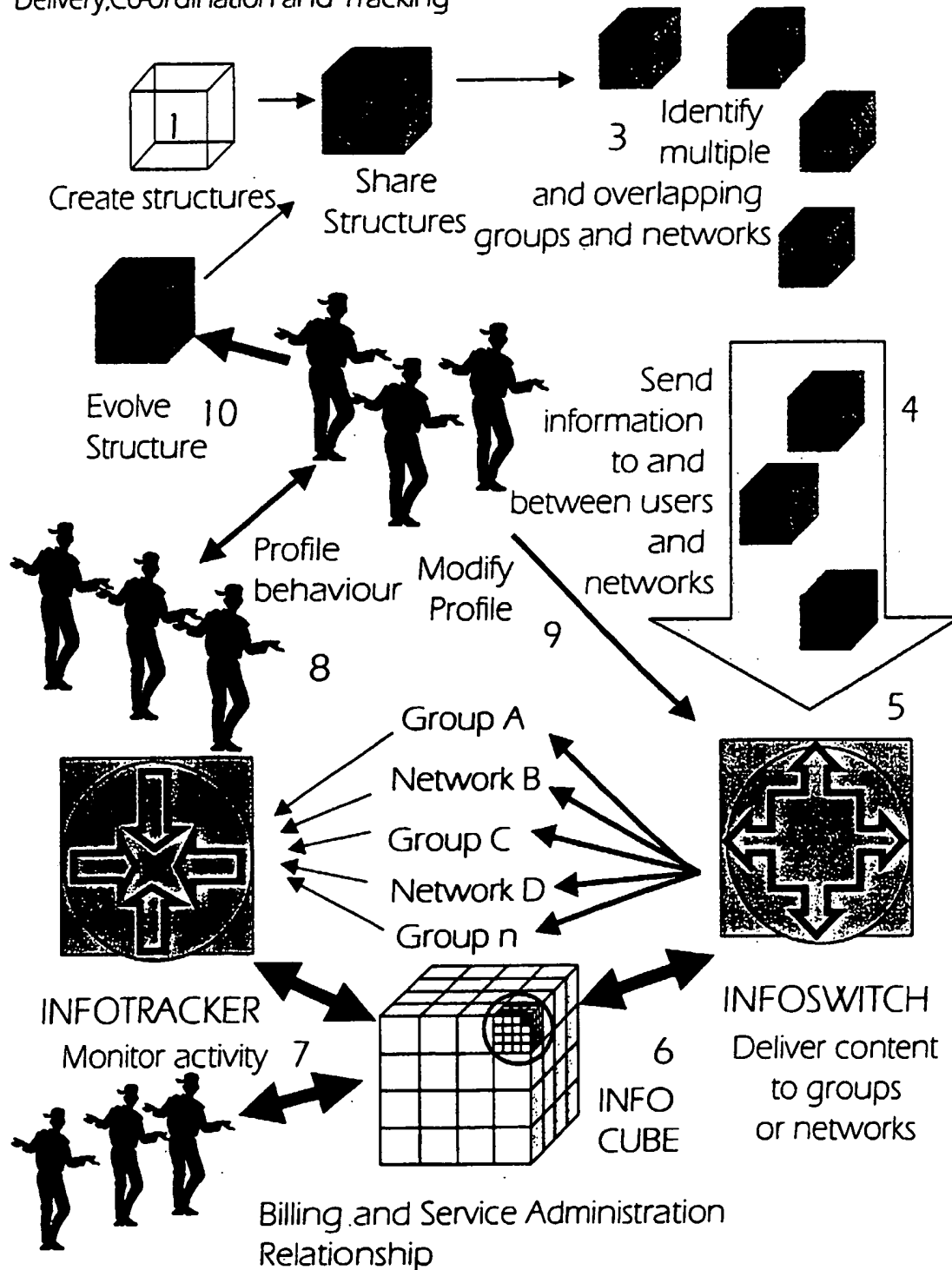


Figure 11

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Realising Ubiquitous Graphical User Interfaces (UGUI's)

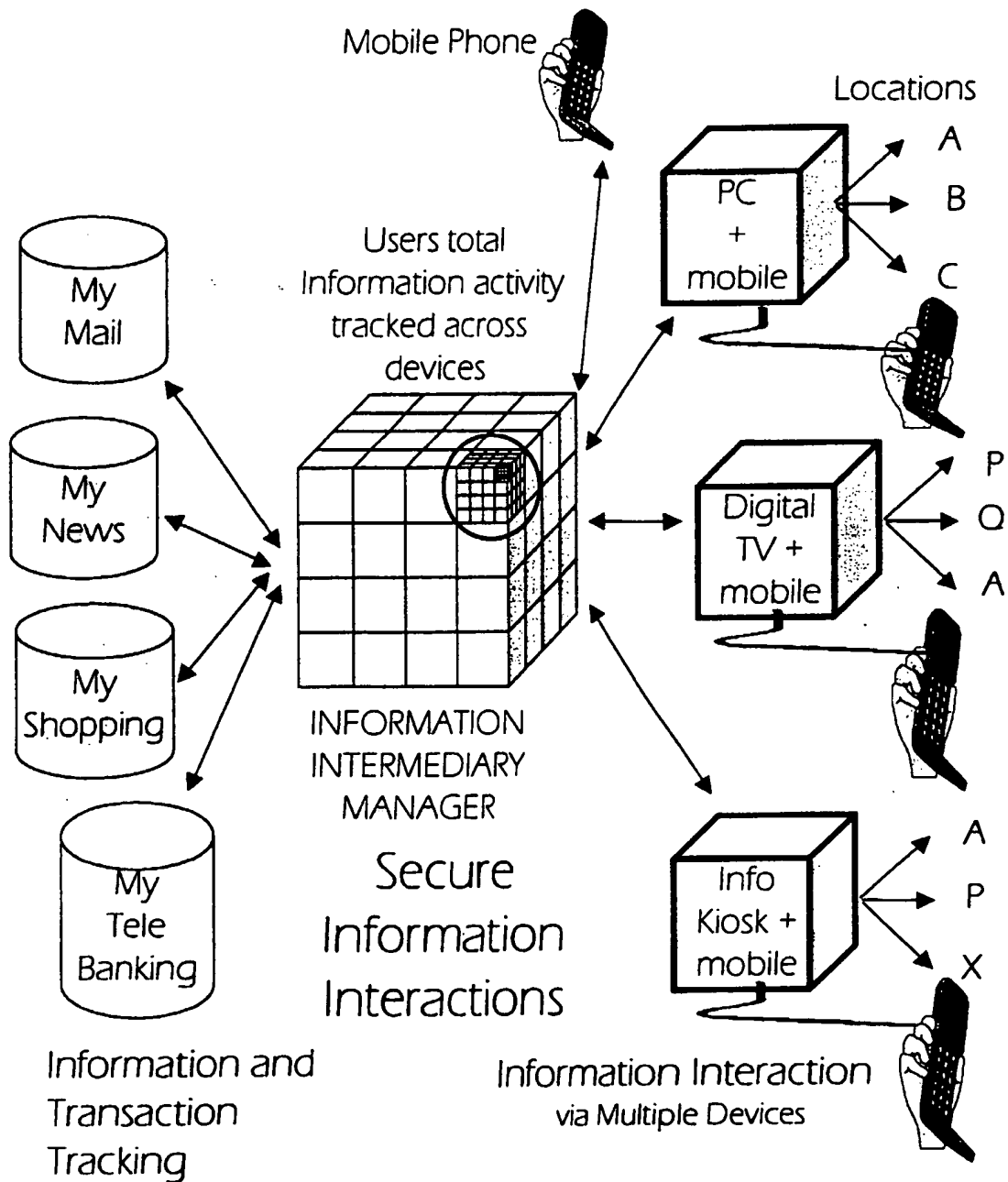
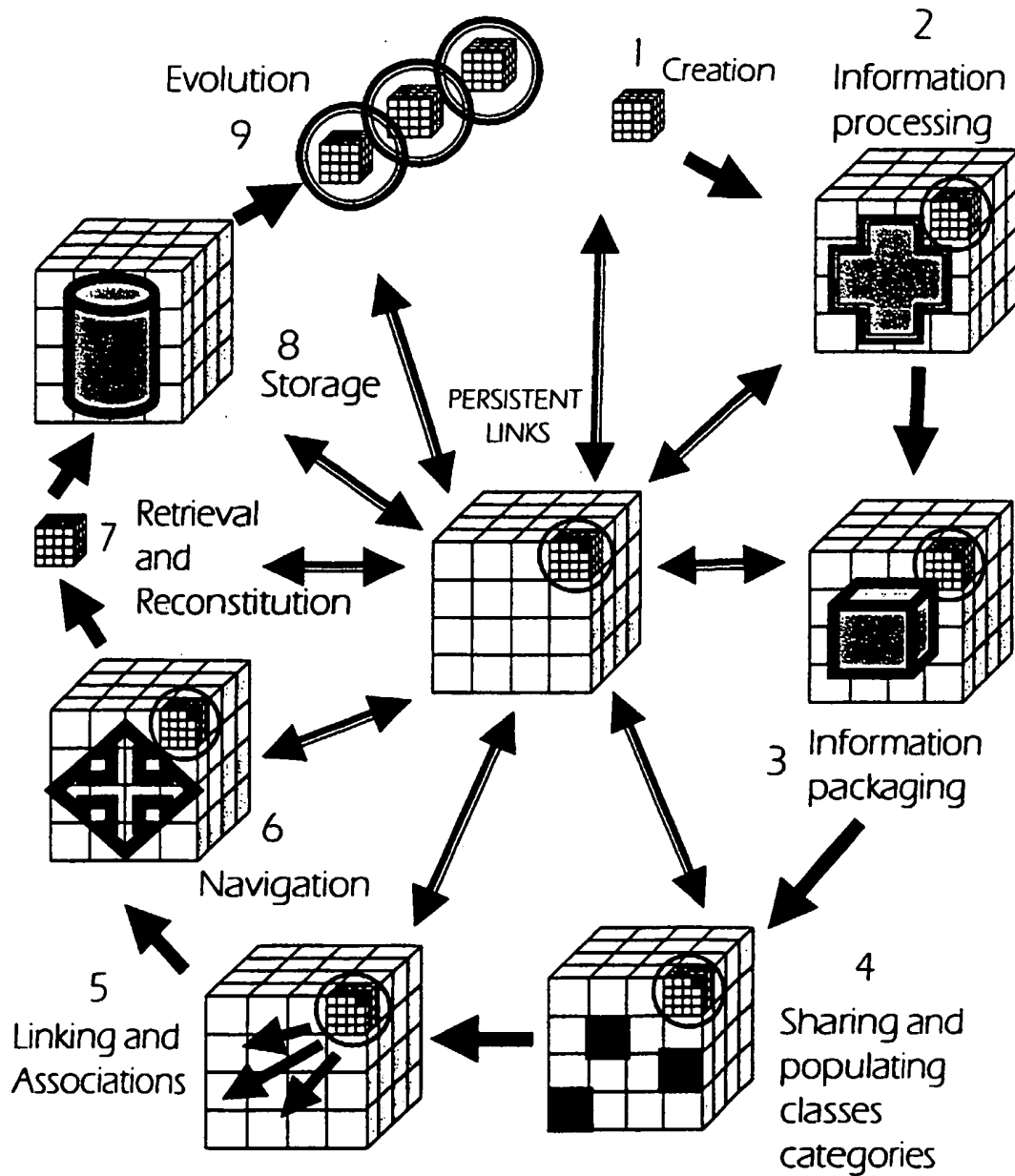


Figure 12

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Persistent Multi-network Links and Coherent
Information, Interaction and Transaction



Methods for information interaction using both mobile and fixed communications and single and multi-screen displays for enhanced functionality, transaction integrity, security and usability.

Scope of the Invention

The present invention relates to methods and processes that are used for creating and sharing structured information frameworks across a multitude of users, devices, networks and content providers that use shared categorisations iteratively applied to build information structures. The resulting interchanges made possible by such structuring, sharing and co-ordination across networks between individuals, groups, documents and devices, provide for new functionality and enhanced security in areas of communications, community and commerce, amongst others. The methods and processes address these areas, and encompass the infrastructure, features, facilities, devices, and knowledge to support same including but not limited to hardware, software, communications and content.

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Background

The take-up of mobile telephony has been remarkable, both in its speed, and in the level of penetration. Much of the success is due to the convenience, ease of use and relatively low cost. So much so that mobile phones, as well as personal computers, have become ubiquitous devices in many countries.

The success of the mobile phone, and the continuing development of its technology platform and infrastructure brings the possibility of even higher rates of data transmission, opening up new applications such as web interaction and video conferencing. The rate of take up of new services depends in part on the ease of use of the functions and facilities, so usability and usefulness are important elements in the overall level of success.

In this world of increasing complexity there are dangers that basic human limitations in dealing with information and digital devices will be overlooked. The ability to invent ever-greater degrees of complexity for digital devices can overwhelm users and detract from usability. One has only to consider the vast functionality, and size, of some personal computer office software suites to recognise the drawbacks of over-

complexity. Only small proportions of the possible features are actually used by the average user. This indicates the importance of the challenge of devising and developing easy to use solutions. A more human-centric focus to invention and creativity may result in less functionally rich devices, but paradoxically this could increase overall usability.

In the search for killer applications for the next generations of mobile telephone it is important to establish usability and usefulness as key criteria in applications development and deployment. Yet a mobile phone can be seen as a stand-alone device, albeit connected to a network, and like any stand-alone device it exhibits limitations in terms of functionality. Islands of discrete information technology need to be tied together for true integration and interactivity. New generations of mobile phone offer the potential of providing the glue for other discrete intelligent devices. This current novel methods shows how mobile phones can provide an important component to integrate other items of information technology into more holistic and more effective systems, solutions and services.

The methods described here demonstrate how by establishing interconnectivity and interoperability standards between mobile telephone and other information technology devices and associated networks the usefulness and security of all the various components, solutions and services is enhanced. To see how this is achieved we need to look at the prior art in a number of areas to establish some of their limitations and to show how with novel methods and approaches the mobile phone can become an integral part of ubiquitous and secure human-computer-content interactions.

Structure

There has been a general avoidance of consideration of "structure" within Internet development, and its absence is concerning. Structure seems to be equated with tradition and establishment whilst the Internet by its very conception and design has developed in an anti-structure manner. Yet structure, by itself, is neutral, so the issue becomes whether any degree of such structure is useful. That structure exists at the heart of the World Wide Web is indisputable. It is only because there is general consensus about the rules of operation that the Internet works. Without uniform rules of application it would be impossible to exchange information.

At issue is whether some element of structuring would also be useful at the higher levels of activity, relating to information and applications as well as at the lower levels relating to transport, interconnection and inter-operability. In the present novel method, structure is at the heart of the method and process, and whilst the method is not intended to cover the whole of Internet activity, it is relevant to processes relating to information, presentation, navigation, processing, interaction, transaction and storage.

Network-centric application services

Important as individual characteristics such as browsing, navigation and information retrieval are in their own right, it is equally important how the various factors are combined in the delivery of services. Certain inventions have sought to provide innovations for more than one element of an information cycle. For instance, Davies et al (1996 WO 96/23265) propose a method for accessing information using an agent-based access system using keywords combined with a profile of potential user interests. This is designed to overcome the richness of information provision over the Internet where the lack of central monitoring and control hinders users getting the information they seek when and where they require it. Their so-called "JASPER" agents (Joint Access to Stored Pages with Easy Retrieval) stores meta-information to provide a pointer on or index to information when a retrieval request is made.

Their emphasis is on information retrieval rather than, as in the current novel method, the notion that relevant information is already there, available and accessible. With the current novel method there is differentiation between categorisations (the structure), populations of items within the category (the items), and movement around the structure (navigation and personalisation), there is no requirement for retrieval until and unless the user wants to go outside the paradigm and method and actually engage user-instigated retrieval. If and when they do there are a variety of established methods for doing this which are outside of the scope of the focus of this current novel method.

Another holistic approach to human-content interaction can be found in Olsson (1999), where again the focus is on how to automatically or semi-automatically find and retrieve information for a user according to his preferences. In this case the information is identified through the exchange of so-called "relevance" agents. Rather than undertake filtering and retrieval using content analysis of material, or on the basis of others recommendations of items of potential relevance, the method proposed by Olsson is to use a combination of methods. By relying on two agents a "collection" agent, and a "selection" agent, with the former placing documents in a central repository, from which the latter retrieves potential matches of documents and user interests for presentation to the user. "Interface" Agents are required to capture the different interests of a user, and since each user can have multiple "Interest" agents, each with a list of other interest agents the logistics of realisation can be seen to be excessively complex. Such complexity is generated by attempts to do with computer calculations what users in the current method do naturally, which is to categorise and select information according to those categorisations. There is no need to postulate the existence of multiple agents, as they are not required if, as with the present method, human cognitive and social abilities are combined with computing capabilities in a more sympathetic manner. Agents are redundant in a situation where information is not retrieved from an amorphous mass, but is packaged and selected with human cognitive abilities playing a part at both sender and receiver points. The novel method proposed here requires only one process, the same process, at sender and receiver ends, and so according to Occam's Razor is a more likely explanation.

Agents also figure large in a system and method for co-ordination and control of information supply proposed by British Telecommunications (1998 European Patent EP 0 967 545 A1). Again the method uses a variety of agents in a distributed

environment, with information being passed back and forth between agents to ensure the user gets the information they are searching for. Since each agent is seen to perform a particular task there is again a requirement for a multitude of agents, and again with such a multitude there is a requirement for a multitude of co-ordinating agents and processes. The very complexity of the process hides the requirement for a simple iterative method and process that handles all the different aspects of the information cycle. Logically if, as in the present method, one single process can handle a multitude of different activities at both sender and receiver ends there is no need to postulate the existence of multiple interacting agents. By taking a broader view of the information cycle, including both information sender and information receiver, and by establishing processes shared by both and iteratively applied to different components of the information cycle the situation becomes easier to explain, predict, control and exploit.

Communications with persistent connectivity

It is surprising since the Internet is all about content and communications that there are not more Patent Applications about communications methods and processes. Content and Search algorithms are relatively well catered for in comparison. Yet persistent connectivity, to supplement intermittent connections, is rapidly emerging as a next major challenge in Internet evolution. With "always-on" connections from DSL over traditional telephone lines, with G3 developments planned for mobile telephones, and with Digital Audio Broadcasting and Mesh Radio distribution, as well as other developments with wireless and other distribution mechanisms we are rapidly approaching a situation of considerable potential contention between different competing networks.

One Patent on Service Provision Systems for Communications Networks (British Telecom 1995 WO 95/30317 examines the potential for service provisioning across both fixed and mobile networks. By exploiting software agents in the different network domains they show how service provisioning and maintenance is enhanced with a series of distributed and relatively independent agents. Unfortunately the methods do not cover content, navigation and services (as distinct from service) provisioning. Nor do the methods cover persistent connectivity with one or more networks and so important potential innovations are ignored. Like much of the rest of the literature, the basic Internet model of "connect to a URL, extra the needed information and then drop the connection" is adopted.

Locality in content retrieval and communication

Locality has been neglected in dealing with human-computer interaction although there have been attempts to overcome the shortcomings. One approach is to segment large databases, for targeted marketing and promotional activities amongst other things. For example Saxe 1997 (US Patent number 5,636,346) establishes correspondence links between households on interactive cable networks, and the delivery of relevant and specific information to target households. By using a unique electronic address for each household a degree of privacy is preserved.

Patent WO/22495 (2000) uses sophisticated computing algorithms to determine whether or not specific information should be sent to specific locations as based on geography (or inferred geography) of the receiving device.

And Chomet (1987,US Patent 4,645,873) establishes method for linking databases with geography in a proposed national database with a plurality of databases each with local information, and with interrelationships between each of the databases, so that individuals can select, to an extent, the information they consider relevant to them. And sending e-mail information to specific groups of individuals is addressed by International Patent WO 00/20975 (2000).

Although these approaches go some way towards improving the situation, they are still dealing with the symptoms of the difficulty and not the underlying cause, which is the lack of encompassing frameworks and methods for dealing with information, as distinct from data. Indeed, the profound nature of the weaknesses inherent in current structures can be revealed in even a brief consideration of the Internet data transmission methods. Information is transmitted through a variety of computers using Internet Protocol (IP) addresses, yet this is not geography specific and this can lead to delays in packed transmission.

Digital Island (2000, WO 00/38381) proposes ways of adding geographic cues to routing to make packet delivery more rapid and secure. This anarchic approach to information, in contrast to the more structured routes followed by telecommunications links, was one of the design criteria to make the Internet infrastructure "disaster proof". Those who designed the Internet could not have foreseen its popularity, and for there to be an evolution in functionality and usability there needs to be an evolution of some of the design features. Adding geography cues for the transport and distribution of data as Digital Island propose is a small step in the needed direction, but far more important are the social and other group memberships and the correspondence between such multiple memberships and the underlying geographic distribution of people, groups and resources. The database structures that relate to social groups and personal interests is an important area in Internet evolution and the present invention supports different types of individual and group interactions.

With the explosion of electronic communication there has been a fragmentation in the naming conventions for electronic communication within an overall loose framework. There are a multitude of addressing schemes with little or no correspondence between electronic location and physical location making delivery and retrieval of geographically and other locally focused segmented services difficult. Administration of such services is also becoming an increasingly high overhead.

Multiple classifications

One of the limitations of prior art is it has limited itself to logical approaches to classification and display, and has ignored psychological processes. Logically the same element cannot be in more than one place at the same time, yet psychologically it is possible for elements and categories to enjoy multiple positions in multiple categories at one and the same time. Art, laughter and many other aspects of human behaviour exploit this capability of multiple categorisation, yet computing innovations largely ignore it because it is difficult to deal with in totally automated manner.

Instead human cognitive and creative processes need to be involved in the classification and categorisation.

So for example, Agrawal et al (1998 US Patent 5,799,300) provide an efficient method for selecting and combining data elements within a data cube, but only where the same item cannot appear in multiple categories or positions in the data cube at the same time. Similarly Pooser and Pooser (1998 US Patent 5,812,134) provide techniques for users to navigate hierarchical information spaces within databases. This has the advantage of allowing the user to view the logical relationships between particular units and the overall structure, but is not able to deal with the psychological processes involved where there are multiple, non-exclusive, overlapping and simultaneous relationships between elements.

Similar limitations of a focus on only logical relationships applies to Agrawal et al (1998 US Patent 5,832,475) in their work on "Group-by" operations within data cubes, and that by Cline et al (1999 US Patent 5,900,880) which explores how to create surfaces with visual perspectives from mathematical calculations of points within surfaces and cubes. In neither these nor other cases is there any process for the creation of psychological, not logical, entities with the creation of data tied to its presentation and navigation through the application of iterative base building blocks as there is in the current novel invention.

Where more attention is given to the human component in human-computer interaction, as in the invention of a navigation method in 3D computer-generated pictures by 3D image manipulation (Benayoun 2000, WO 00/42495), there is no differentiation of the content into psychological categories and classes and no link between the navigation device and the elements being navigated other than that both are in the same 3 dimensional space. Again a process tracking the whole information cycle, using the iterative application of components is absent.

Distinct, non-overlapping data groups have allowed post-hoc regrouping and re-classification according to the data descriptors and elements, but only within the pre-structured dimensions and only with mutually exclusive grouping. In the current invention the groups or categories can not only be overlapping but the category elements are themselves filled from occasional continuous or media streaming events and activities such that the composition of the categories is ever changing, and individual items can appear in a number of distinct and separate categories.

To date there has been only limited exploitation of this basic human characteristic of multiple overlapping categorisations in the design of human – computer interfaces. There have been applications of multidimensional cubes for the display (Hitachi 1997) and for the storage and retrieval of data elements, but these have concerned method of display or speed of access along single dimensions not multiple overlapping and interacting dimensions. And nor has there been an attempt in prior history to apply the same structure and process and method to all elements of an information cycle including creation, transmission, retrieval, navigation and storage.

There have been many inventions that relate to multi-dimensional forms of computer representation, but these have tended to ignore the human perceptual and cognitive elements, or these have been restricted to hierarchical forms of information

processing, or both. These limitations are overcome with this novel method and process

What is clear is that with the proliferation of computer systems in so many areas of life we now have in advanced countries a situation where individual details are held in a multitude of databases. With Tax and Social Security records, Health, Home and Bank details all held on different and sometimes incompatible computer systems, nowhere is there a "picture" of the whole individual. With the sophistication of today's computer systems, and their ability to track detailed transactions, many would argue that a co-ordinated series of databases would be an intrusion on privacy and civil liberties. Even so, the lack of structured frames of reference for organising information relating to individuals, their physical location, personal interests, social and virtual groups hinders interaction, communication and exploitation.

Integration

Important as individual elements are in any method, process, or solution, more important in the overall quality of the experience is the degree of integration between different components, and how effectively they inter-work one with another. Because the method and process described here uses a minimum number of components that are iteratively applied the degree of integration between the elements is higher than it would otherwise be. This is important in achieving an appropriate user experience. Quality of integration also impacts ease of use and speed of learning which are both important factors in gaining acceptance for new and novel methods and processes.

End-to-end services delivery

By encompassing both the senders of information and the receivers of content in the method and process described here, and by using the same component methods and processes repeatedly at different stages of the information cycle, not only does this novel method and process deal with content creation, delivery, navigation and exploitation, but the method incorporates from the outset the concept of end to end service quality. It is only because cognitive and information structures are shared by senders and receivers that the method and process can be sustained and evolve, and such sharing has within it the possibility of notions and metrics for service quality. Without persistent links and without shared information structures, and processes, service quality measures are difficult to establish. The novel method presented here establishes end to end service quality and metrics opportunities.

Problem

A significant potential problem for end users comes from simultaneous enhancements to a number of different information and entertainment channels. The Internet, Intranets, Digital TV, home networking, home information and entertainment systems and mobile phones all bring additional communications, interaction and transaction opportunities. This could present learning challenges, and the possibility for learning

interference. As developments follow their different paths end users can too easily be faced with a multitude of different interface designs, standards and interaction procedures.

Not only is there the possibility of diverse electronic interfaces but each of the components, Internet, Digital TV, Home Infotainment, mobile telephones and other intelligent devices, all bring their own infrastructures. Not only is this costly, these costs ultimately being passed onto end users, but there is the additional cost and complexity of bringing harmony and co-ordination to different delivery channels. This requires further invention and investment to be realised, without adding anything to the quality of the user experience or the ease of support.

The cost and complexity do not stop with infrastructure. In addition there are the potential duplications from "extra-structure", activities that must be performed simply to administer the separate channels. These include: -

- Administration of set-up and authentication
- Security
- Billing
- Interoperability
- And so on

Paradoxically at the same time there is this diversity, there are emerging a limited range of common standards in the infrastructures to deliver different services across different media channels. Such things as

- TCP/IP
- XML
- MPEG
- DVB
- GSM, GPRS and G3

all ensure an underlying consistency of approach to delivery of services and applications. By supplementing these standards to a limited extent the method provides simplification and enhancement to delivery of the various independent digital solutions and services. The methods described below show how this is achieved.

All the different intelligent and interactive services relate to a small number of activities, namely

human communication, interaction and transaction.

between individuals, groups and institutions. So why should a multitude of different infrastructures be required? One effective meta-structure as proposed here is able to deal with the majority of user requirements, whilst adding useful functionality to previously discrete technologies and solutions. Further, such a meta-structure simplifies the need for inter-working paradigms and solutions.

On the face of it the mobile telephone is a poor choice – limited bandwidth (at the moment) and limited display size. The former will be addressed in due course but the latter will remain. There is interest and commercial investments in Wireless Application Protocol (WAP) and General Packet Radio Service (GPRS) but from a usability viewpoint the screen display is too small. It may be acceptable for urgent short items and simple text messages, but could have limitations beyond this.

Likewise the personal computer, despite all its benefits, suffers limitations. Even in its portable form it is bulky and expensive, whilst desktop models consume space and for many users all personal computers are overly complex and intimidating. Flat screens improve the space demands, but the overall complexity remains. Interestingly flat screens, like computers, follow Moore's Laws about increasing in performance and decreasing in price, so display devices will proliferate. This offers the opportunity to provide connection points and services and solutions and integrate with mobile phones to permit more integrated solutions and systems and services to be delivered.

Together ubiquitous mobile phones and ubiquitous computers, flat screen and other displays, with connectivity between the two domains, offer interesting possibilities when, as proposed here, the two and their networking infrastructures are effectively interconnected, as described below.

Essential Features

The mobile phone, the personal computer and the flat screen and other display devices all suffer limitations. We see below how some of the limitations can be overcome by treating these discrete devices as elements within an overall holistic framework. Not only are limitations overcome, but integration brings better and different services into existence. The islands of devices can, with the effective inter-working and interoperability described here, become integrated components of new and better ways of working and operating. This novel method proposes the mobile phone, in addition to its established functionality, be extended to act as a communications gateway to provide the glue between discrete technologies, providing via the combination of networks and traffic an underlying digitally watermarked channel for enhanced information and transaction exchange.

By linking computer and other screens and display devices not only to existing terrestrial networks but also simultaneously to mobile networks, with interaction between the two network infrastructures made possible many issues and problems are simplified or resolved, and enhanced and new services can be delivered.

What is proposed here are portable, secure additional mobile phone facilities that link to and interact with existing and new devices, exploiting their inherent capability and add an additional dimension of personal identification and authentication via multiple connections to different underlying networks. The mobile phone – with this proposed enhancements – becomes the vehicle for simplification, enhanced functionality and improved security, by treating it not just as a stand-alone device but as a component in a wider and more integrated digital infrastructure.

An essential feature of the method is the establishment of interconnectivity between two or more discrete devices, and two or more categories of networks, the Internet networks and the mobile phone networks. This is not just for the exchange of information but for a more intimate control, with other information passing between them and on to attached servers and services. By linking these two, and not just using the WAP or other mobile phone connection capability to access the Internet for information display to the phone screen alone new possibilities open up.

The data throughput capacity of the two networks by being linked and co-ordinated provides enhanced services beyond the capabilities of the networks in isolation. The combination simplifies activities such as authentication, administration and billing, to improved usability and security. The computer or other display screen is used to provide information and interaction whilst the mobile phone is used for security and administration, including, if required, billing fulfilment.

By linking the mobile phone to suitable display devices with the phone SIM card and password used to provide enhanced security any suitably equipped display device can be used as an authenticated and secure workstation, display or computer. The user becomes mobile not just in the mobile telephony world, but also in the computing and Internet worlds as the mobile phone linked communications throughput provides the security required for this to be effective.

This method for interaction between discrete networks and infrastructures opens up the "best of all worlds" - mobility, security, connectivity, device independence, authentication and single points of billing for goods and services received, from simple voice traffic all the way through to rich multi-media applications.

What is proposed in addition to the established standard uses of the mobile phone is that it becomes in addition to an end in itself an authorisation channel to other services via its linking to a variety of interfaces and infrastructures. This method establishes the need for, requirements of, and structures, processes, techniques and methods to link the mobile phone and its associated infrastructure with the computer or display device and associated network and infrastructure, to deliver a more functional, more secure, more robust and truly ubiquitous, and integrated digital networks for information, transaction, interaction and action.

With the introduction of such solutions and services the inter-linkages to other devices is possible whilst simultaneously preserving the capability to make and receive telephone calls at the same time, thereby ensuring existing mobile telephony user service does not deteriorate.

A feature of this method is the linking of two disparate network infrastructures of mobile telephony and fixed Internet, such that the digital information streams carry information elements from both networks over and above the simple display of information. This makes use of the individual network capabilities and strengths to offer in combination enhanced levels of functionality, service, security and use of use when interacting with digital information and transaction and content streams.

A feature of this novel method of an overlay and interaction of two or more information streams via their associated networks is that it provides for and delivers digital watermarking opportunities for interactions and transactions.

Another feature of this novel method for combined and integrated networking infrastructures is that it provides ubiquitous user interfaces for individuals to interact with a variety of different intelligent devices, with different characteristics, in different locations and at different times such that a degree of commonality in navigation is provided and preserved, and consistent and if need be unduplicated underlying streaming of information can be provided and delivered across diverse devices.

The method has the feature by combining two or more networks, at least one fixed and one mobile of enabling additional features and facilities over and above those possible with either network in isolation. The same is true for multiple fixed or multiple mobile networks as well as for combinations of networks. Because of the method these additional features are delivered whilst at the same time preserving or enhancing the simplicity of the user interface and navigation.

Those skilled in the art will readily appreciate the extension of the method to a variety of other intelligent devices when these are provided with the required connectivity points and software, hardware, networking and interfaces. Such extensions will make possible consistent and ubiquitous connectivity and interactivity from a variety of home, work, mobile and other devices.

A number of preferred embodiments of the present novel invention have been described in some detail herein and for those skilled in the art many modifications and variations will be apparent. It is my intent therefore to be limited only by the scope of the appending claims, and not by the specific details presented by way of example and illustration.

Introduction to Drawings.

The present invention will become more fully understood, and the foregoing and other features and advantages of any preferred embodiment will become more readily apparent by describing by way of example only and with reference to the following drawings and descriptions, which are not limitative of the present invention, by which: -

Figure 1 shows the method for establishing and populating shared information categories and structures with content, delivering such content to multiple devices connected to multiple networks, co-ordinating and tracking activities and evolving the structures, all with iterative methods and processes. The steps in the method, or variations and modification thereof to achieve the same or similar ends include the following: -

1. Creation of structures
2. Sharing of structures

3. Creation of content tagged for the created structures, with multiple memberships of categories possible for any item, and with the content created according to described and defined rules and structures
4. Delivery of the content to different networks via a variety of other products, services and solutions including computers, routers, software, networks and other components.
5. Delivery to a variety of devices attached to the variety of networks
6. Navigation of the information and interaction structures with methods that have a family resemblance across the variety of devices and networks, and consistent ways of interacting with the structured content.
7. Co-ordination of the information streams and flows, and actions and interactions arising out of them through co-ordinating and tracking processes, devices networks and other components.
8. Evolution and subsequent sharing of the evolved structures to provide a feedback loop for the ongoing continuous improvement and evolution of the method and process.

Figure 2 shows the iterative application of the method to different stages of an integrated information cycle. Such iteration ensures a commonality and consistency of the process and methods across the whole information cycle.

Figure 3 shows an embodiment of the method and process in a telephone handset to turn it into a multifunction device. Such a device can be used to access a whole variety of networks and services with a simple to use and easy to navigate interface. In this instance the device is tailored for easy access and navigation of cube information structures, services and solutions. A mobile phone with a smaller display could have a subset of this design or the embodiment of the method into a virtual keyboard or voice activated control method or similar.

Figure 4 shows the interface consistency when the same method and process is applied to other devices such as the personal or laptop computer or personal digital assistant, or for access to flat and other screens in information kiosks and other devices..

Figure 5 shows the iterative application of the method and process to a variety of devices to provide cross-device consistency.

Figure 6 shows the various elements within the method for interaction between discrete information technology infrastructures. For illustrative purposes we have shown the digital streams as waves to convey the intimate nature of the interaction and integration, although these can combine into a digital streams with interacting sub-elements.

Figure 6a shows the stream associated with Internet and other interactive network traffic, whilst Figure 6b shows a similar stream for mobile phone activity. Figure 6c provides an illustration of the combination of these two infrastructures, in this case for a personal computer with linked mobile phone attached, but it applies equally to other information appliances.

Figure 6d shows different digital “signatures” for different users, again in the form of waves for illustrative purposes although again in reality we are talking of integrated digital information streams of alpha/numeric/symbol form. This combination of elements, which we have illustrated as a digital helix, is in effect a digital watermark specific to the individual and their mobile phone which doubles as a security link, if required, even down to the level of individual transactions.

Figure 7 shows how users can access networks and services at different locations and via different devices and because of the associated digital signature – a kind of digital DNA – an integrated user view is preserved for security and billing and administration purposes. This degree of security with just a personal computer and network by themselves is difficult or impossible to achieve. With the combined networks, and with the location sophistication of mobile telephony, the provision of such secure and mobile access becomes practical.

Figure 8 gives examples of potential application areas. Figure 8a shows multi-screen displays, for example a less secure Internet screen and a more secure Intranet screen to minimise threats from hackers into sensitive personal, group or organisational data and information, and a mobile phone linking the two for additional functionality and security.

Figure 8b shows how a link with a Mobile phone and Digital Television is effective such that even different users in the same home or other location can access a fixed device like a television for interactive services, and via their own mobile telephone connection provide enhanced functionality, personalisation, authentication and security. This enables different users to use the same fixed device, at different times, in an easy and effective manner.

Figure 8c shows how a mobile phone can be linked to an information “kiosk” to deliver personalised information streams and services, and to Global Positioning Systems and other displays to provide enhanced facilities, turning the GPS display into an interactive data and information terminal for Internet and other communications access.

Figure 9 shows the interactivity between fixed and mobile networks during an illustrative purchasing cycle where at several stages during the cycle one or both parties benefit from the additional security and other features from the linkage of the multiple networks, although many other value and process chains are equally open to the method as one skilled in the art would be able to identify.

Figure 10 shows the ubiquitous nature of the combined device and mobile phone subsystems, which further benefits from a harmonised user interface design and navigation framework. Users can navigate the information and transaction spaces with a degree of uniformity across devices despite differences in the characteristics of the different output and interactive devices.

Figure 11 shows the realisation of a ubiquitous graphical user interface (a U GUI) across a variety of devices and networks and service and application providers such

that there is a consistent user interface across the different devices and user identification streams from the connectivity of the mobile phone to other devices.

Figure 12 provides a summary view of the method and process throughout the information cycle. This can be supported with intermittent links between users, devices, networks and services, but the method and process take on additional possibilities when linked in to some or all persistent connectivity infrastructures.

Examples

The integration of discrete fixed and mobile networks opens up a number of more sophisticated applications, and at the same time makes authentication, security and billing that much easier. Amongst the improved application possibilities are the following: -

E-mail

becoming totally mobile and secure facility, even for multi-media documents secure receipt at suitable display stations with the phone providing the secure link. Access from any point is possible in a secure manner when devices have the necessary connection parts and software, including direct delivery of content to the mobile phone for required items

Personalised information streams Turns any access point into a personalised device for required news, sport, weather, travel, shopping, business and other information bought to the individual whatever device they are using, without the need to undertake extensive personalisation of the computer, workstation or other intelligent device that require to use.

E-Shopping

Secure knowledge of the person undertaking the transaction, and the supplier providing the services, with an intermediary in the financial exchange cycle adding extra reassurance to end users during electronic transactions.

Home Interaction

Confirmation via the mobile phone signature the person changing home intelligence, home security, home information and entertainment parameters are authorised to do so.

Secure document interchange Authentication that the parties involved in a secure document transaction are authorised to do so, with the possibility of secure remote storage of any resulting documents.

Global Positioning

Interaction between GPS systems and current location via the mobile phone cell location capability, for example to provide displays of local restaurants, theatres and shops and the like and to provide offers in real time that would be more difficult to provide with existing GPS solutions.

Billing

Ease of billing with transactions added to individual or group mobile telephone accounts and bills, and only passed on to the supplier of goods and services when acknowledgement is received the transaction is complete and satisfactory, and

Information Co-ordination

With different streams of traffic to the mobile phone, personal computer, digital TV and other devices the user receives not a mass of uncoordinated streams, but rather a managed information and transaction flow. The user then enjoys a harmonised and holistic information infrastructure.

In essence the mobile phone, its SIM card and password provide the equivalent of a permanent "Public and Private Key Encryption" capability for all applications. The password can be modified if need be in real time, with parties in a transaction informed of updates. The transaction authorisation code could even change during the duration of an on-line transaction making security that much greater, with the mobile phone "channel" and network interoperability being the vehicle for communicating such changes.

This provides an authentication stream over any IP or other stream that a particular phone or other device is attached to a particular computer or display device or other intelligent outlet, and the link remains so long as that phone is attached. Duplication becomes difficult as two phones with the same identification can never be logged on at the same time, or if a SIM card is duplicated it is a relatively easy matter to identify the illegal duplicate

User benefits

The user gains a number of advantages from the linkage of two or more networks, including: -

- Mobility
- Ubiquity
- Portability
- Universality

Great as the benefits are from mobile telephones and personal computers linked to the internet, the potential for services and solutions is that much greater when, as proposed here, the discrete information infrastructures are combined into a holistic, unified, ubiquitous information infrastructure.

The mobile phone has brought communications and convenience to millions of people. Likewise the Internet has enjoyed considerable popularity. Newer generations of mobile phone offer Internet access and other facilities to broaden their appeal. Even so there are inherent limitations, not least with the display size. The mobile phone even with the new facilities and with its communications capability remains a discrete device. Under proposals put forward here, we show how the mobile phone becomes an integral link in a more holistic information infrastructure, by delivering over combined network streams digital authorisation and enhanced security. Via the linking of the two or more networks, and with the inherent security and mobility features of the mobile phone, a digital watermark can be provided during interaction sessions to increase confidence in transaction integrity, and to provide easy mechanisms for billing and other administrative functions. Together the mobile phone and the Internet have proven to be popular and beneficial applications. Combined and integrated beyond the level of mere access to each other's networks the combination provides the foundation for truly ubiquitous, mobile, secure and useful information infrastructures.

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Claims

Having thus described my invention, what I claim and desire to secure by patent is:

1. I claim a method and process for the creation of structured documents and categories that can be combined to form classes of content, event, activities and experience with senders and receivers of information sharing the structures for the exchange of content, communications, transactions and interactions, comprising none, some or all of the following steps, or variations or modifications of the sequence to achieve similar ends:-
 - Creation of a structure, be this for documents, categories, classes or other domain or area of content, communication, interaction, transaction, perception, cognition or social behaviour
 - Sharing of this structure with others through written or spoken communication or electronic means or some other method
 - Creation of content containing tags to locate content within a structure or structures, not necessarily exclusively but allowing for multiple realisations, versions, variations, positions and overlaps
 - Source, stream, multicast or in some other way deliver content to individual or group recipients, to single or multiple devices from servers, databases, across fixed and wireless networks or in some other manner
 - Users accessing the categories, containing content that has been delivered whether or not this replaces or supplements or extends earlier content, for all categories and classes or for those categories and classes selected by one or more end-users
 - Users navigating the structure in a variety of ways under their control or automatically, with the navigation sharing attributes of the base method and process and its iterative application
 - With personalisation, tailoring and temporal characteristics of the receiving structure under user control or shared between receivers and senders of information or communication
 - With evolution of the structure by senders and receivers by reference to the existing structure and categories and classes to allow for modification, evolution and developments
 - With evolved structures being shared with some or all other users for activity, communications, interaction or transactions or any combination thereof
2. The method and process of Claim 1 further comprising the step of the iterative application of the base method to form more sophisticated information and other structures and applied to a wider range of content, applications, interfaces and devices, including none, some or all but not limited to the following, each of which has the capability for multiple realisations within any and all structures as required: -
 - Content within a document, structured according to the method and process

- Documents, structured according to the method and process
- Categories of documents created by grouping of items along one or more dimensions of similarity
- Classes of category formed by grouping such items along one or more dimensions of similarity
- Meta-structures formed by further iterations or variations of the method and process
- Events, historic, current or future
- Activities, historic, current or future
- Experience, historic, current or planned
- Delivered to a computer, television, digital assistant, wireless device or other more or less intelligent device, including hardware software, networking and similar devices
- Transmitted across fixed or wireless or digital audio or satellite or other network including telecommunications, cable, wireless and other infrastructures, public or private or combinations thereof
- To an individual, or a group or a community or some wider audience or some combination of these groups including multiple memberships of any of the above

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The method and process of Claim 1 comprising the further step of populating of the categories and classes of information with information from sources, or streams, or multicast to fill or supplement, complement or replace some or all of the information already contained within the categories and classes with none, some or all of the following characteristics: -

- Retention of, or potential to re-establish, links to the original document, category or class event, experience or activity, if need be to reconstitute a facsimile or duplicate from remaining consistent parts
- Ability to appear in one or more than one category or class at one and the same time
- A retained knowledge of the relevance, links and associations between an items and other items derived from its location within and between one or more structures
- An ability to track variations of the document or other objects across variations, modifications, versions and across networks to different locations, people and devices
- An ability to display information appropriate or not to any particular receiving device or combination of receiving devices
- An ability to track and communicate the position within the information structure to any other device also used by the same user to access the same information at the same or a different time
- An ability to navigate within, between, and across structures using a variety of devices including but not limited to controls, buttons, pointers, joysticks, mice, touch-sensitive screens, voice commands and other ways

- 4 The method and process of Claim 1 comprising the further step of personalising the information structures of documents, categories and classes through none, some or all of the following ways
- Selecting certain document types as having higher relevance to one or more devices such that information appropriate to a device is displayed according to the device limitations unless overruled by specific user activity.
 - Selecting certain categories as being of higher relevance and attaching some mathematical or other tagging mechanism to indicate such interest, with this affecting the number and type of items filling a particular category.
 - Selecting and prioritising certain classes as having higher relevance with regard to the information available from sources, streams or multicasts.
 - Impacting the order that documents, categories and classes are received so user prioritisation is always possible in situations of resource or processing or other constraints or requirements.
- 5 The method and process of Claim 1 comprising the further step of maintaining administrative and financial logs or records associated with user activities for information, security and billing purposes, with some or all of the following characteristics, where billing can include both billing and credit transactions: -
- Billing by any form or combination of usage of hardware, software, networking, human or other resource
 - Billing by volumes of information received or accessed
 - Billing by volume of information excluded
 - Billing by extent of filtering, or personalisation or similar modifications of the base method and process
 - Billing by source of information
 - Billing by timeliness of information
 - Billing by the breadth or depth of the information accessed or any combination thereof
 - Billing by any factors associated with information delivery and navigation including by not limited to click through rates, banner advertising, promotion and counter promotion, or any element or sequence on a value chain from information of a less deep or more deep variety, analysis, comparisons, evaluations, transactions and value of goods transacted or any combination or extension therein.
- 6 The method and process of Claim 1 comprising the further step of transmission of information to individuals, groups or multiple groups using the features, facilities, cues and other attributes of the information structure, singularly, or in combination with each other or in combination with other devices.
- 7 The method and process of Claim 1 comprising the further step of modifications and evolutions of the base method and process and its

iterative application within the same domains of information and activity or different domains

- 8 The method and process of Claim 1 comprising the further step of providing a family of similar interfaces to a variety of different devices with the interfaces sharing common features of the base method and process such that the content-device interface has none, some or all of the following characteristics: -
- Devices use a common method for structuring, ordering and sequencing across devices
 - Devices use a common method for navigation and access of different documents, categories classes and other features
 - Any device is capable under user control of accessing any or all of the full feature set of the core document structures, albeit with limitations of speed, display or other limitations
 - Interactions and transactions from any and all devices can be tracked by a meta-structure, using further iterations of the base method and process which contains a full profile of all user activity and behaviours for administration, security and billing purposes, subject to user privacy and national and international security and other requirements.
- 9 The method and process of Claim 1 comprising the further step of Information Providers using or providing interfaces and standards and reciprocal billing information and arrangements where these are required with none, some or all of the following characteristics: -
- Users and providers agree the basis of the billing mechanisms and the costs associated with information access and transactions
 - Information providers assume the financial and other risks associated with transactions of any sort
 - Information Providers remain legally responsible for the information they provide for onward transmission to users and for any other aspects of the interactions or transactions arising from their content.
- 10 The method and process of Claim 1 comprising the further step of users agreeing the billing and other administrative and financial arrangements associated with delivery of information to a variety of devices, with no consequential or other liabilities for the method and process and structure that is used to facilitate the information provision and transactions
- 11 The method and process of Claim 1 comprising the further step of various user profiles and activities and transactions forming, via the further iterative application of the base method and process, information superstructures with other individuals or groups for whatever purpose, including none, some or all but not limited to the following: -
- Content or transaction delivery or fulfilment

- Administrative, financial, legal, geographic or other requirement whether currently foreseen or not
- Creation or maintenance of physical, social or virtual groups or communities or any combination thereof.

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The method and process of Claim 1 comprising the further step of using an iteration of the base method to create structures, naming conventions, and identifiers for individuals, groups, communities and multiple groups memberships, with none, some or all of the following characteristics: -

- Any individual or group to have a variety of identifiers indicating membership of physical, social or virtual groups, including multiple and overlapping memberships, with, when known, some or the totality of memberships maintained and delivered as unified or differentiated streams depending on user preference and activity
- Allocation of unique identifiers comprising prefix or suffix of both, whether random or not, to individuals, subgroups, groups or communities such that members of the same unit have an identical prefix or suffix or both
- At the same time and in parallel allocation of locator tags or identifiers based on geography, which remain overt or covert depending on requirements, security and other factors, such that unique identifiers can also when required exhibit geographic and other cues, for security, location, physical deliveries and similar requirements
- The potential for senders or receivers or information, or both, to use physical cues, social cues, virtual cues or any combination thereof to direct content to more or less inclusive groups, subgroups or multiple groups or any combination thereof.
- An ability to use combinations of the unique and locator identifiers to facilitate content delivery over network alternatives according to any requirements or combinations of requirements at any particular time including none, some or all of the following:-
 - Least cost routing
 - Direct route routing
 - Aggregated routing for physical groupings
 - Routing selected to maintain quality of service levels
 - Routing following prescribed geographical routes
 - Random routing
 - Multiple routing across the same and different networks to similar or diverse devices or both
 - Any combination of the above or variations and modifications thereof to achieve similar ends

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The method and process of Claim 1 comprising the further step of creating billboards, message groups or other display facilities for directing messages to any subgroup, group or overlapping or

intersecting groups, be these physical, social, virtual or any combination thereof

- 14 The method and process of Claim 1 comprising the further step of having content relating to a locality as defined within the base method on a less or more inclusive scale according to user requirements, available for any members within that locality to use, or for any other individual or group requiring such information to also have access to locality specific information, with navigation within and between domains according to the base method and iterations thereof, including none, some or all but not limited to the following: -
- Skills, trades, professionals and similar groupings
 - Shops, outlets, warehouses and similar
 - Restaurants, Cinemas, Theatres, Hotels, Leisure facilities and similar
 - Jobs, permanent, temporary and interim
 - Classified advertising of any or all products or services or combinations thereof
 - Places of interest
 - Hobbies, interests and other physical, social or virtual groupings
- 15 The method and process of Claim 1 comprising the further step of using the locality, grouping and membership cues and tags for administration, billing, crediting, security and control to any individual or group of any single or combined goods, services, usage, utilisation or combinations thereof
- Billed to individuals
 - Billed to groupings of whatever type
 - Or to any combination of the two, or other variations thereof
- 16 The method and process of Claim 1 comprising the further step of using the base method and process and iterations thereof, embodied in methods, processes, procedures, business practices, value chains, hardware, software, networking, databases, storage and other similar devices, together with the structured and shared content, categories and classes, and the locator and other cues to track, respond to or anticipate user requirements when using a variety of devices to access information sources, streams, multicasts and other distribution methods so as to retain a user position and perspective with regard to the information presented and display across different devices with none, some or all of the following characteristics: -
- User position is retained across any and all devices that are active at any particular time in a tightly coupled or loosely coupled fashion or combinations thereof, according to user preferences and device capabilities
 - Content delivery to or action on one device transmitted to other linked and active devices, as appropriate to their capabilities if need be

- Activity or reaction on one device transmitted to linked and active devices, and reflected in inactive devices the next time they are activated
- Traces, logs, actions and transactions within and across none, some of all devices are logged for administration, service, and billing
- End to end activity is monitored to provide quality of service metrics, and to interface these into any or all administration, billing, crediting, and service quality penalty measures, debits or credits for users, information providers, third parties or any combination thereof

17 The method and process of Claim 1 and Claim 16 comprising the further step of allowing users single designations and sign on passwords to a variety of devices if they so choose, or to associate and if required integrate discrete identities on different networks for administrative and billing purposes.

18 The method and process of Claim 1 and Claim 16 comprising the further step of establishing interfaces, standards, inter-working, interoperability or any combination thereof with the providers of networks, services, facilities, entertainment or work or leisure free or paid for managed services or similar infrastructures such that the end-to-end integrity and coherence and integration of users of the base method and process is maintained, or not as required

19 The method and process of Claim 1 and Claim 16 comprising the further step of providing co-ordination across a variety of different media distribution channels, networks, information providers and similar to provide a comprehensive series of services that work across diverse and discrete devices in a manner that provides a family resemblance in the interface, navigation and access techniques, with a low level of duplication and redundancy of content and a low level of duplication of user activity.

20 The method and process of Claim 1 and Claim 16 comprising the further step of some or all of the content distribution channels being "always on" and available such that information and transactions can be periodically or constantly sourced, streamed or multicast to the receiving devices with none, some or all of the following characteristics: -

- Where persistent links are available the user through the co-ordination of different devices is made aware to whatever devices are active if and when there is activity using their unique identifier on any or all other channels for security and integrity of actions and transactions
- That where information services of whatever type agree that common and uniform electronic naming conventions based on the base method and process and structures can be implemented across different domains to open up opportunities for consistent naming in electronic and virtual spaces similar to lifetime personalised

numbers available within the telecommunications arena.

21 The method and process of Claim 1 and Claim 16 comprising the further step of the introduction of media distribution centres for media of a variety of different types capable of being sent to a variety of different devices, simultaneous and successively, with the potential of end-to-end quality of service links on some or all of the different distribution channels, with individual or group or some combinations thereof of usage, activity and transactions monitored to provide an information, communications, interaction and transaction utility similar to the energy, water, telecommunications, financial and entertainment utilities or combinations thereof.

22 The method and process of Claim 1 and Claim 16 comprising the further step of using two way flows of information about user activity in order to co-ordinate delivery of information and avoid duplication and redundancy within the same media channel or across different media channels at the same or different times with none, some or all of the following characteristics: -

- A user-centric view of activities and actions, interactions and transactions is maintained across the different information boundaries, devices, service and information providers
- The flow of structured information, co-ordinated across discrete channels or devices or both by people, systems, software or some combination thereof, providing a foundation for the co-ordinated information supply, communication, interaction, transaction, monitoring, quality of service, administration and billing mechanisms, procedures and processes
- An ability to contact and communicate with others on line at the same time, pre-selected or sought and searched on the basis of locality, identifier and other cues or combinations thereof from one or any of a variety of different devices whilst retaining the integrity of the transaction or transactions.
- An ability to modify the processes, profiles, sources, streams or other distribution, communication and transaction activities as a result of the flows of single and co-ordinated stream of activity across single or multiple devices to provide feedback loops, controls, security and evolution of the base method and process and iterations thereof.

23 The method and process of Claim 1 and Claim 16 comprising the further step of using the end-to-end connectivity and combining this with the infrastructure and transmission and security characteristics from two or more networks on a single or multiple linked devices to provide additional interactive two or more way communications for enhanced security and integrity of the actions and transactions, with none, some or all of the following characteristics: -

- The security and other features of one device with its temporary or permanent connection combine with and interact with the security

and other features of the second network to produce a higher level of security and reliability of the actions and transactions

- The combined features of the single or multiple devices and the multiple networks and connections together form new methods and processes for action, communication, interaction and transaction that could form the basis of new and novel business and other processes, value chains and re-engineered activities that benefits some or all of the parties in the interactions.
- The combinations of features, facilities, applications and activities opens up new end-to-end transaction relationships for businesses, consumers and other individuals, groups and multiple groups.

24 The method and process of Claim 1 and Claim 16 and Claim 23 comprising the further step of providing a universal, integrated ubiquitous, graphical user interface for a variety of types of communications, actions and transactions, said interface providing for more secure transactions across a variety of devices for a variety of services and goods and transaction providers and users and intermediaries and third parties.

25 A method and system according to any one of the preceding claims wherein information content or communications or transactions are structured, with the structures shared between information providers and information recipients and based on classification and categorisation on the basis of similarity with items able to appear in multiple classifications or categories at one and the same time.

Amendments to the claims have been filed as follows

Claims

A number of preferred embodiments of the present novel invention have been described in some detail herein and for those skilled in the art many modifications and variations will be apparent. It is my intent therefore to be limited only by the scope of the appending claims, and not by the specific details presented by way of example and illustration.

Having thus described my invention, what I claim and desire to secure by patent is:

1. I claim a method and process for using the network connectivity, embedded security and knowledge of a mobile phone end user combined with the interactivity of fixed communications networks and the interactivity between two or more sets of devices and networks and the creation of multidimensional information structures to deliver interactions and transactions exchanges between and across multiple networks and devices to provide enhanced security and administration enabled by establishing the point of location of an individual or transaction within a multiple device and network space with all participants in the transaction being aware of said physical, psychological or electronic locations.
2. The method and process of Claim 1 with the additional step of using the multidimensional information space that is created by content and service creators, aggregators and providers, and the multidimensional content populating such information structures as a multidimensional user interface for a mobile phone or similar device so users can navigate the information spaces in ways equivalent to navigating physical spaces with 360 degree of flexibility as required, and with predictive interaction for any multidimensional space by using the equivalent of spatial navigation on the hardware, software and content of a device.
3. The method and process of Claim 1 and Claim 2 with the additional step of using the multiple devices and networks, and the knowledge of a users stated or inferred preferences to tailor the information or transactions presented to a user thereby personalising the said space at the intersection of the different networks, devices, content providers, content aggregators and service and application providers.
4. The method and process of Claim 1 and Claim 2 and Claim 3 with the additional step of creating a meta- or super-structure of all activities within multidimensional spaces with a single harmonised multidimensional user interface for navigation, personalisation and interaction, this providing a basis for administration, billing and revenue collection and distribution, as well as a reference architecture and structure for other non-multidimensional information providers to interface to.
5. The method and process of Claim 1 and Claim 2 and Claim 3 and Claim 4 with the additional step of using a mobile phone connected to a network as the

vehicle to tie together other intelligent devices on other networks and service providers to provide mobility with security of access from any device on any network by using the interactive connectivity and interactive interface of a mobile phone as an additional carrier wave of digital information to and from other networks to enable, authorise, monitor, track, coordinate and administer interactive activity on other multiple networks through a single point of billing and administration, with if required a common multidimensional user interface on any or all devices to deliver consistency of interaction and ease of use.

6. A method and system according to any one of the preceding claims wherein software and hardware and systems and networks associated with mobile telephony and information interaction are combined through points of contact with other networks and service providers and content creators and aggregators, maintaining the consistency of experience with information, content or communications or transactions across multiple devices and networks by establishing structured, shared multidimensional information spaces for providers, recipients and intermediaries and aggregators, and using the multiple networks and their interactions to support harmonised and integrated delivery of multidimensional or other content, such multiple network and service connectivity supporting information coordination through the introduction of monitoring Meta Agent Managers of hardware, software, databases, networks, connectivity and communications as indicated in Figures 1 to 12 of the associated drawings.



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Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.T): G4A[AUDB, AUXX]

Int Cl (Ed.7): G06F17/30, --

Other: ONLINE: Internet, Epoque

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
XE	GB 2 361 329 A [Ross] See whole document	All
XE	GB 2 358 717 A " "	"
XE	GB 2 358 778 A " "	"

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.